

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (2008-2010 Batches) (Sem.-1,2)

## ENGINEERING CHEMISTRY

Subject Code : CH-101

Paper ID : [A0110]

Time : 3 Hrs.

Max. Marks : 60

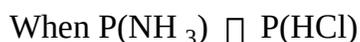
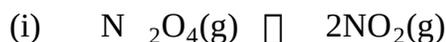
### INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

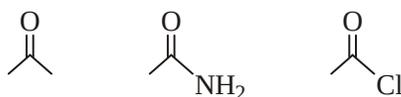
### SECTION-A

#### I. Write briefly :

- (a) Why the water is soften before using in boiler?
- (b) Why rusting of iron in saline water is quicker than ordinary water?
- (c) What is the basic principle of chromatographic techniques?
- (d) What is the difference between specific conductance and equivalent conductance?
- (e) Distinguish between Thermal and Photochemical Reactions.
- (f) Define Syndiotactic Polymers.
- (g) What is Chemical shift in NMR?
- (h) What is Frank-Condon principle?
- (i) Determine the number of components, number of phase and degree of freedom on the following equilibrium :



(j) Which of the following will absorb at higher wave number for C=O stretching



### SECTION-B

2. Explain the cold lime-soda process for the removal of hardness of water and give the difference between cold and hot lime-soda process. [8]
3. (a) Describe sacrificial anodic method for corrosion prevention with an example. [4]
- (b) What are inhibitors ? Explain types of inhibitors employed to control corrosion. [4]
4. Write short notes on gas chromatography and HPLC. [8]
5. (a) Derive Nernst equation and give its significance. [5]
- (b) Calculate the EMF of the given cell at 298°K [3]
- $\text{Ag(s)}|\text{Ag}(\text{NO}_3) (0.018 \text{ m})|| \text{Ag}(\text{NO}_3) (1.2 \text{ m})|\text{Ag(s)}$

### SECTION - C

6. (a) Discuss various theories of mechanism of photosynthesis. [5]
- (b) Define quantum yield. Discuss reasons for low and high quantum yield. [3]
7. (a) "IR spectra is often characterized as molecular finger prints." Justify this statement. [3]
- (b) Calculate the number of vibrational degrees of freedom in following compounds: [3]
- (i)  $\text{CO}_2$     (ii)  $\text{SO}_2$     (iii)  $\text{CH}_4$
- (c) Which of the following molecules will show IR Spectra and why ? [2]
- $\text{H}_2, \text{HCl}, \text{CH}_4, \text{CO}_2, \text{H}_2\text{O}$
8. Discuss the application of NMR with respect to Magnetic Resonance Imaging. [8]
9. State and explain phase rule. Describe phase diagram of Phenol-water system and triethylamine-water system. [8]